CLAIMS

What is claimed is:

1. A modeling method comprising:

filling a first region with a single instance of a second set of regions regardless of a total number of the second set of regions that would be required to explicitly fill the first region.

2. A geometric construct for modeling systems comprising:

a generally rectangular body having curved surfaces on the generally rectangular body; and

the generally rectangular body is configured to model objects based upon interstitial regions bounded by the curved surfaces.

3. The geometric construct according to claim 2 wherein the curved surfaces are configured having the shape of a portion of a surface of a cylinder.

4. The geometric construct according to claim 2 wherein the curved surfaces are configured having the shape of a portion of a surface of a sphere.

5. The geometric construct according to claim 2 wherein the curved surfaces are configured to allow for embedding of first objects formed by the interstitial regions within second objects.

6. The geometric construct according to claim 2 wherein the curved surfaces are configured to allow for virtual filling the object formed by the interstitial regions into a second set of regions.

7. A method of modeling objects in a system comprising:
forming objects within a modeled system using interstitial regions between geometric units, the geometric units having a plurality of concave surfaces thereon defining the interstitial regions.

8. The method according to claim 7 further comprising:
forming cylindrical shaped objects using the interstitial regions.

9. The method according to claim 7 further comprising:
forming spherical shaped objects using the interstitial regions.

10. The method according to claim 7 further comprising:
embedding formed objects within other formed objects.

11. The method according to claim 7 further comprising:
virtually filling a formed object within a modeled region.

12. A modeling method comprising:

arranging at least one of a first region or a first set of regions such that the first region or first set of regions contains at least one of a second region or a second set of regions;

embedding at least one of the first region, a first set of regions, or first set of regions containing the second regions or the second set of regions into a complex third region individually or as an array, and so on to form a plurality of complex levels.

13. The modeling method according to claim 12 further comprising: rotating a first set of regions as part of the embedding process.

14. The modeling method according to claim 12, wherein said embedding step further comprises:

including only a portion of the first region, first set of regions, first set of regions containing the second regions or the second set of regions, that lie within the complex third region into a model.

15. The modeling method according to claim 12 further comprising:

placing portions of two or more sets of the first region, first set of regions, first set of regions containing the second regions or the second set of regions, regions in the same spatial volume within the third complex region with desired material representation at each point in space.

16. The modeling method according to claim 12 further comprising: embedding a virtual fill region into the complex third region.

17. The modeling method according to claim 12 further comprising:

describing a set of generalized geometry constructs by quadratic surface equations that may be embedded into the complex third region.

18. The modeling method according to claim 12 further comprising:

using geometry constructs that exactly fill a complex third region resulting in the neutron tracking being performed much faster than in normal operation.

19. The method according to claim 12 further comprising:
modeling a fissile system based upon the formed objects.

20. The method according to claim 12 further comprising:
obtaining an effective neutron multiplication factor of the modeled system.

21. The modeling system according to claim 1 further comprising:

modeling a generally rectangular body having curved surfaces on the generally rectangular body;

configuring the generally rectangular body to model objects based upon interstitial regions bounded by the curved surfaces; and

allowing for virtual filling of an object formed by the interstitial regions into a second set of regions.

22. The modeling method according to claim 1 further comprising:

arranging at least one of a first region or a first set of regions such that the first region or first set of regions contains at least one of a second region or a second set of regions;

embedding at least one of the first region, a first set of regions, or first set of regions containing the second regions or the second set of regions into a complex third region individually or as an array, and so on to form a plurality of complex levels; and

embedding a virtual fill region into the complex third region.